küschall®
designed for life

KÜSCHALL **CHAMPION**

CE

DEALER: Keep this manual.
The procedures in this manual MUST be performed by a qualified technician.

Service Manual

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GENERAL

Introduction

This service manual is part of the instructions and contains the technical information for servicing, configuring and repairing a küschall® wheelchair.

WARNING!
Danger of accident and severe injuries.

If the wheelchair is improperly set it can cause accidents and severe injuries.

- **Changes to the wheelchair may only be carried out by the dealer.**

To guarantee the required safety and reliability, all wheelchairs must be comprehensively checked once a year.

In part, assembly and adjustment require extensive experience. For this reason, the following assembly instructions have been split into three categories:

Requirement	Symbol
Easy – technical understanding required	●○○
Intermediate – specialist knowledge required	●●○
Difficult – specialist wheelchair assembly knowledge and experience required	●●●

The required tools and their respective sizes are listed above each instruction. The instructions include information on the torques with which the respective screw connections must be tightened. Adhering to the given torques requires the use of a torque spanner.

Tools	Symbol
Allen key	⬢ *2x3, 4, 5, 6*
Phillips screwdriver	✖ *2*
Straddle spanner	▬ *19, 11*
Socket spanner/ring spanner	⬡ *8, 10, 14, 22*

Spare parts and adaptations

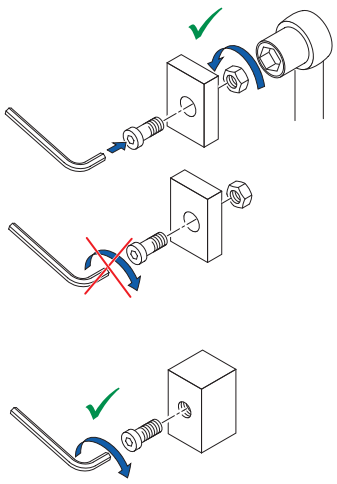
All spare parts can be purchased from küschall®'s Customer Services. An electronic spare parts catalog is available by logging onto www.kuschall.com. Only original spare parts may be used. Installing additional adaptations to a küschall® wheelchair requires the prior written approval of Küschall AG.

Tightening Allen screws

Allen keys are not designed for greater forces. When tightening or loosening an Allen screw, it is therefore advisable to apply force to the nut to prevent the hexagon socket from being damaged.

Tightening and loosening

- Turn the nut with a socket spanner (only use a straddle spanner if there is insufficient space) and merely hold the screw tight with the Allen key.



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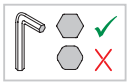
Tightening and loosening if there is no nut

If an Allen screw is directly screwed into a screw thread, the screw must be tightened using an Allen key.

Ensure that the Allen key is of good quality and not worn.



Torque

- All screw connections must be tightened with the torques specified in the following instructions.

Checks

Visual check

- Check all components for cracks, especially the areas around joints and welded seams.

Checking the screw connections

- Check all bolts with the torques specified in the instructions regularly, and adjust if required.

CAUTION!
Several screw connections have been secured with thread locking adhesive. If these are opened, they must be secured again using new thread locking adhesive. Liquid high-strength and low-strength adhesives are available. For torque entries notice shall be made whether an adhesive and which adhesive needs to be used.

Identifying and alleviating malfunctions

Malfunction	Possible cause	Measure
The wheelchair will not move in a straight line	Incorrect tire pressure in a rear wheel	Correct tire pressure
	One or more spokes broken	Replace defective spoke(s)
	Spokes unevenly tensioned	Tighten excessively loose spokes
	Dirty or damaged wheel bearings	Clean or replace bearings
	Bearing block of castor fork is not vertical	Align bearing block vertically
	Front wheels not set to the same height	Position the front wheels in such a way that they touch the ground at the same time
	Rear wheels not parallel or axes not aligned	Adjust the prestress load on the scissor mechanism and/or the trail
The wheelchair tips backwards too easily	Rear wheels have been fitted too far forward	Fit rear wheels further back
	Backrest angle too great	Reduce backrest angle
	Seat angle too great	Mount the adapter plate lower on the side profile
		Mount the smaller castor fork
The brakes engage poorly or asymmetrically	Incorrect tire pressure in one or both rear wheels	Correct tire pressure
	Brake setting incorrect	Correct brake setting
Roll resistance is too great	Insufficient tire pressure in the rear wheels	Correct tire pressure
	Rear wheels are not parallel	Ensure that the rear wheels are parallel
The front wheels wobble when moving fast	Insufficient tension in the front wheel bearings block	Lightly tighten the nut in the bearings block axle
	Front wheel is worn flat	Replace front wheel
The front wheel is stiff or stuck	Dirty or damaged bearings	Clean or replace the bearings
The wheelchair is very difficult to unfold	The backrestcover is too tight	Loosen the backrestbands a little
Handling seems imprecise	The scissor mechanism is not closed properly	If required, remove dirt from scissor mechanism
	The scissor mechanism is misaligned	Realign the scissor mechanism

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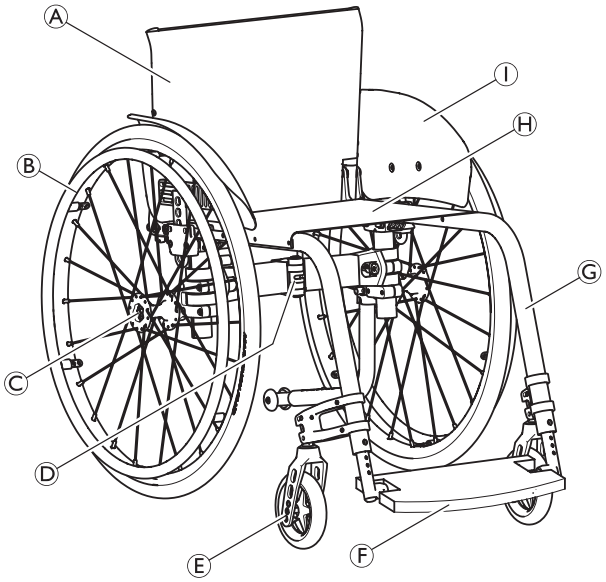
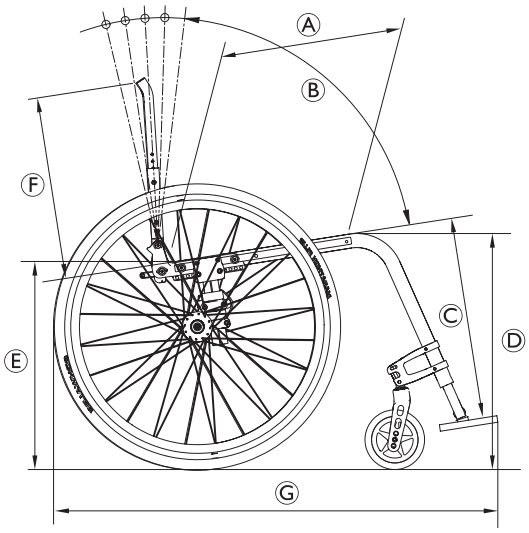
OVERVIEW

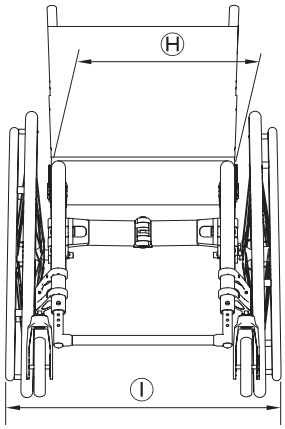
Components



Ⓐ	Backrest
Ⓑ	Rear wheel with handrim
Ⓒ	Quick release axle
Ⓓ	Folding mechanism
Ⓔ	Front wheel fork with front wheel
Ⓕ	Footrest
Ⓖ	Frame
Ⓗ	Seat
Ⓘ	Mudguard

Dimensions





Ⓐ	Seat depth	340 – 480 mm, in increments of 20 mm (AL / TI) 400 – 460 mm, in increments of 20 mm (C)
Ⓑ	Backrest angle	76°/80,5°/85°/89,5°/94°
Ⓒ	Knee-to-heel length	220 – 500 mm, in increments of 10 mm (AL / TI) 300 – 340 / 400 – 500 mm, in increments of 10 mm (C)
Ⓓ	Seat height front	450 – 540 mm, stepless adjustable
Ⓔ	Seat height rear	390 – 490 mm, stepless adjustable
Ⓕ	Backrest height	300 – 465 mm, in increments of 15 mm
Ⓖ	Total length	75°: approx. 825 – 1190 mm (AL / TI) 90°: approx. 775 – 1140 mm (AL / TI) 85°: approx. 800 – 1165 mm (C)
Ⓗ	Seat width	340 – 480 mm, in increments of 20 mm
Ⓘ	Total width Total width, folded	Seat width plus 160 – 240 mm approx. 280 – 340 mm

AL = Aluminium / TI = Titanium / C = Carbon

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FRAME

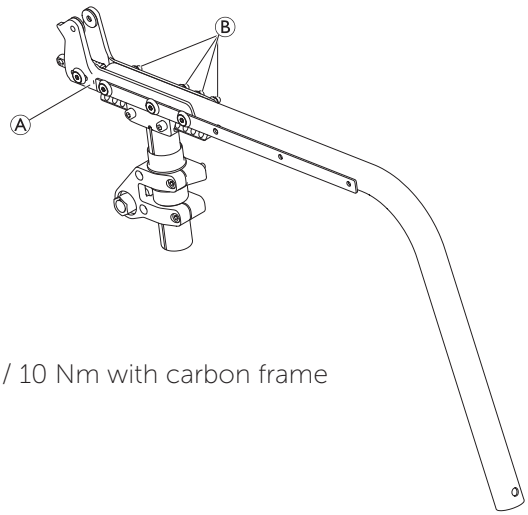
The küschall Champion frame is available in aluminium, titan or carbon.
Aluminium or titan frames are available with frame angles of 75° and 85°, carbon frames with a frame angle of 85°

Changing Frame

Fitting frame tubes

Difficulty: ●○○ *Tools:* ⬢ *4* ⬡ *10*

- Fit both frame tubes into the side supporters Ⓐ using bolts Ⓑ and tighten lightly.



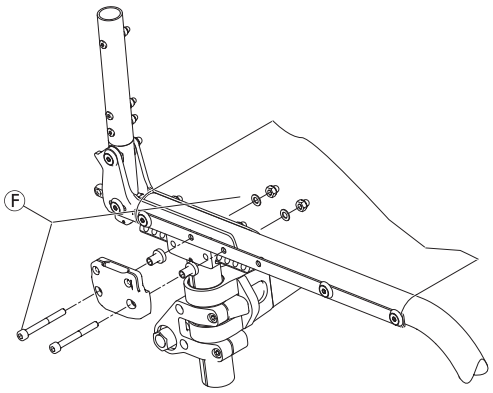
Ⓑ → 13 Nm / 10 Nm with carbon frame

Attaching the side supporters, frame tubes and seat cover

Difficulty: ●○○ *Tools:* ⬢ *5* ⬡ *10*

ⓘ The purpose of the threaded connection through the frame mounting holes is to provide additional fixing. The frame is thus easier to guide and is better secured. Any misalignment of the toe angle of the front wheels is counteracted.

- Attach the side supporters, frame tubes, seat cover and optionally, the holders for siderests using bolts Ⓕ through the frame mounting holes on both sides and tighten.



Ⓕ → 13 Nm / 10 Nm with carbon frame

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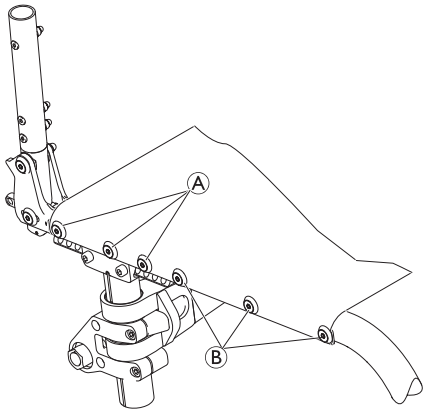
SEAT

Fitting seat cover to frame

Difficulty: ●○○ *Tools:* ⬢ *3, 4* ⬡*10*



■ Fit seat cover to side supports and frame on both sides using bolts Ⓐ and Ⓑ.

Ⓐ → 13 Nm / 10 Nm with carbon frame

Ⓑ → 5 Nm

Front seat height (SHv)

The following possibilities are available to adjust the front seat height (SHv):

- Replace the front wheel with a larger or smaller one,
  → Chap. Front wheels; Replacing a front wheel.
- Replace the front fork with a larger or smaller one,
  → Chap. Front wheels; Replacing a front wheel fork.
- Move the side support on the frame,
  → Chap. Front wheels; Shift supporter on the frame.

Adjusting the front seat height changes the seat angle. It may be necessary to adjust the rear seat height correspondingly.

It must be ensured that the rear wheels are parallel after changing the
front seat height. If required, they must be readjusted,
→ Chap. Rear wheels; Adjustment of rear wheel parallelism.

After adjusting the front seat height the verticality of the castor pins need to be checked and adjusted if neccessary, → Chap. Front wheels; Checking and adjusting the alignment of the supporters.

Front seat height (SHv) per frame size, castor fork and front wheel

SHv [mm]	*Aluminium / Titan frame 75° (long frame) ST 40-48*			*ST 34-38*			*(short frame) ST 40-48*			*ST 34-38*		
	✪3"	✪4"	✪5"	✪3"	✪4"	✪5"	✪3"	✪4"	✪5"	✪3"	✪4"	✪5"
540	-	✓	✓	-	-	✓	-	-	-	-	-	-
530	✓	✓	✓	-	✓	✓	-	-	-	-	-	-
520	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
510	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	-
500	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓
490	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
470	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
450	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

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Front seat height (SHv) per frame size, castor fork and front wheel												
	Aluminium / Titan frame 85°											
	(long frame)						*(short frame)*					
SHv	*ST 40-48*			*ST 34-38*			*ST 40-48*			*ST 34-38*		
[mm]	3"	4"	5"	3"	4"	5"	3"	4"	5"	3"	4"	5"
540	-	✓	✓	-	-	✓	-	-	-	-	-	-
530	✓	✓	✓	-	✓	✓	-	-	-	-	-	-
520	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
510	✓	✓	✓	✓	✓	✓	-	-	✓	-	-	-
500	✓	✓	✓	✓	✓	✓	-	✓	✓	-	-	✓
490	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	✓	✓
480	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
470	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
460	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
450	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Front seat height (SHv) per frame size, castor fork and front wheel			
	Carbon frame 85°		
	(long frame)		
SHv	*ST 40-48*		
[mm]	3"	4"	5"
540	-	-	✓
530	-	✓	✓
520	-	✓	✓
510	✓	✓	✓
500	✓	✓	✓
490	✓	✓	✓
480	✓	✓	-
470	✓	✓	-
460	✓	✓	-
450	✓	-	-

Rear seat height (SHh)

The following possibilities are available to adjust the rear seat height (SHh):

- Adjustment of the adapter plate to the folding unit, → Chap. Rear wheels; Adapterplate, adjustment to folding unit or assembly of new adapterplate.

- Replacement of the rear wheel with a larger or smaller one.

It must be ensured that the rear wheels are parallel after changing the rear seat height, If required, they must be readjusted, → Chap. Rear wheels; Adjustment of rear wheel parallelism.

It must be ensured that the the castor pins are vertical after changing the rear seat height, If required, they must be readjusted, → Chap. Front wheels; Checking and adjusting the alignment of the supporters.

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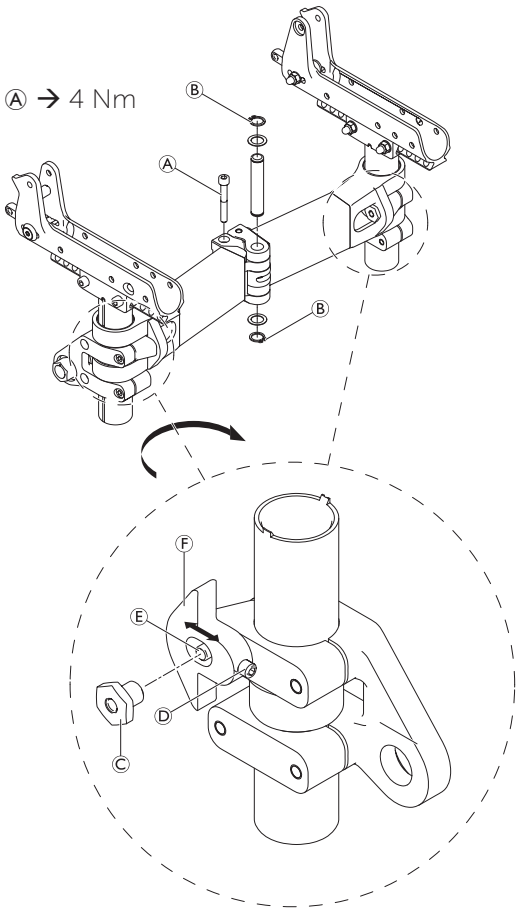
Checking the folding unit

Difficulty: ●○○ *Tools:* ⬢ *5*

The bolt Ⓐ of the scissor mechanism must be checked regularly for play.

⚠ The scissor mechanism must open and close easily.

Check that the retaining rings Ⓑ are sitting well, replace if neccessary.



Ⓒ → 13 Nm (high-strength)

Adjusting the folding unit

Difficulty: ●●○ *Tools:* ⬢*3* ⬡*16*

- Remove the end-stop nut Ⓒ from bolt Ⓔ.
- Apply new thread locking adhesive on bolt Ⓔ.
- Screw the end-stop nut completely on the bolt again, but do not tighten.
- Adjust the end stop Ⓕ of the folding unit by tightening resp. loosening the grub screw Ⓓ.
- Tighten the end-stop nut.
- Carry out the same settings on both sides.

Check that the scissor mechanism opens and closes easily.

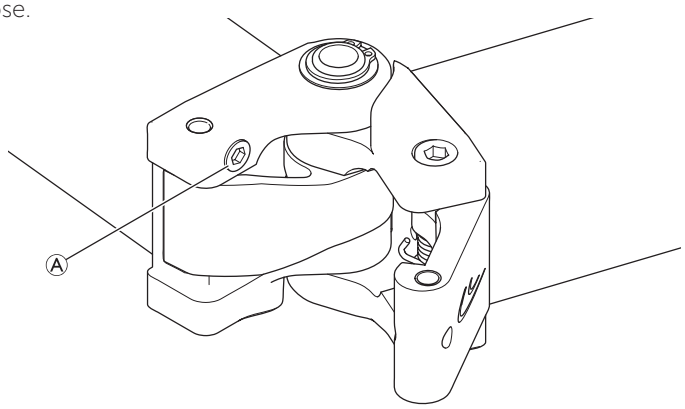
Check the seat cover for sufficient tension in unfolded condition of the wheelchair.

- If neccessary, repeat the steps above until all settings are correct.

Adjustment screw

ⓘ The screw Ⓐ in the folding unit has the aim to reduce play. Depending on the play the screw head is slightly above the surface. The screw is secured and cannot become loose.

! **IMPORTANT!**
Do not modify the screw Ⓐ as it can result in a less easy folding and unfolding of the wheelchair.



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BACKREST

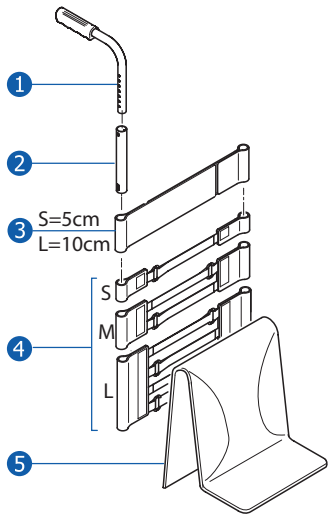
Tension adjustable backrest

IMPORTANT! Risk of damage to the wheelchair.
A too tight band installation may cause damage to the backrest when unfolding the wheelchair.

- Make sure that the backrest bands are only adjusted in unfolded condition of the wheelchair.

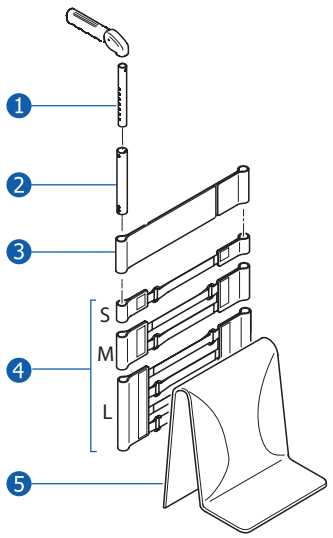
Tension adjustable backrest with push handles standard

RH [mm]	Push-handle ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	❹	Velcro straps with stabilisation bar ❸	❹	❺
300	S	S	L	S+M	not possible		S
315	S	S	L	S+M			S
330	S	L	L	S+M			S
345	S	L	L	2xM			M
360	S	L	L	2xM			M
375	S	L	L	2xM			M
390	S	L	L	2xM			M
405	L	L	L	S+2xM	S	S+L	L
420	L	L	L	S+L	S	S+L	L
435	L	L	L	S+L	S	S+L	L
450	L	L	L	S+L	S	M+L	L
465	L	L	L	M+L	S	M+L	L



Tension adjustable backrest with foldable push handles

RH [mm]	teles-copic tube ❶	Inter-mediate tube ❷	Velcro straps without stabili-sation bar ❸	❹	Velcro straps with stabilisation bar	❺
300	S	S	L	S+M	not possible	S
315	S	S	L	S+M		S
330	S	L	L	S+M		S
345	S	L	L	2xM		M
360	S	L	L	2xM		M
375	S	L	L	2xM		M
390	S	L	L	2xM		M
405	L	L	L	S+2xM		L
420	L	L	L	S+L		L
435	L	L	L	S+L		L
450	L	L	L	S+L		L
465	L	L	L	M+L		L



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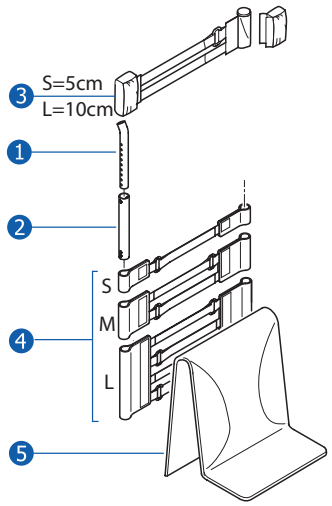
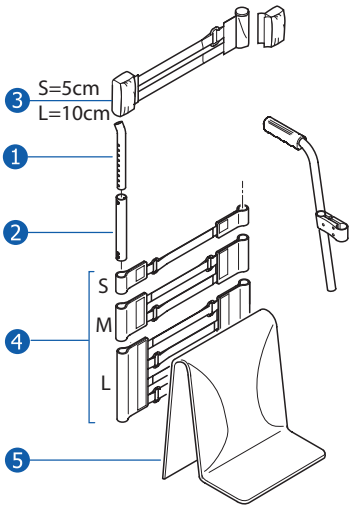
Tension adjustable backrest without push handles

RH [mm]	Telescopic tube ❶	Intermediate tube ❷	Velcro straps without stabilisation bar ❸	Velcro straps without stabilisation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	S	S	L	S+M	not possible		S
315	L	S	L	S+M			S
330	L	S	L	S+M			S
345	L	S	L	2xM			M
360	L	S	L	2xM			M
375	L	L	L	2xM			M
390	L	L	L	2xM			M
405	L	L	L	S+2xM	S	S+L	L
420	L	L	L	S+L	S	S+L	L
435	L	L	L	S+L	S	S+L	L
450	XL	L	L	S+L	S	M+L	L
465	XL	L	L	M+L	S	M+L	L



Tension adjustable backrest with rearset push handles height adjustable

RH [mm]	Telescopic tube ❶	Intermediate tube ❷	Velcro straps without stabilisation bar ❸	Velcro straps without stabilisation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	S	S	L	2xS	not possible		S
315	L	S	L	2xS			S
330	L	S	L	2xS			S
345	L	S	L	S+M			M
360	L	S	L	S+M			M
375	L	L	L	S+M			M
390	L	L	L	2xM			M
405	L	L	L	2xM	S	M	L
420	L	L	L	2xM	S	M	L
435	L	L	L	2xM	S	S+M	L
450	XL	L	L	2xM	S	S+M	L
465	XL	L	L	L	S	S+M	L



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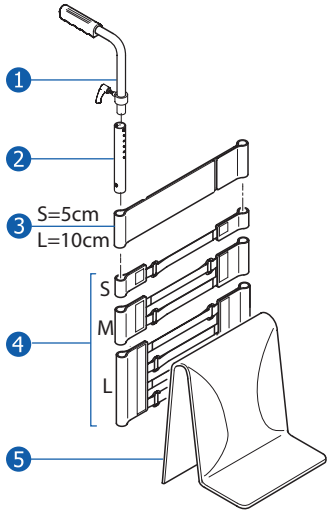
Tension adjustable backrest with push handles, height adjustable

RH [mm]	Push-handle ❶	Backrest-tube ❷	Velcro straps without stabilisation bar ❸	Velcro straps without stabilisation bar ❹	Velcro straps with stabilisation bar ❸	Velcro straps with stabilisation bar ❹	❺
300	Standard push handle	S	L	S+M	not possible		S
315		S	L	S+M			S
330		M	L	S+M			S
345		M	L	2xM			M
360		M	L	2xM			M
375		M	L	2xM			M
390		M	L	2xM			M
405		L	L	S+2xM	S	S+L	L
420		L	L	S+L	S	S+L	L
435		L	L	S+L	S	S+L	L
450		L	L	S+L	S	M+L	L
465		L	L	M+L	S	M+L	L



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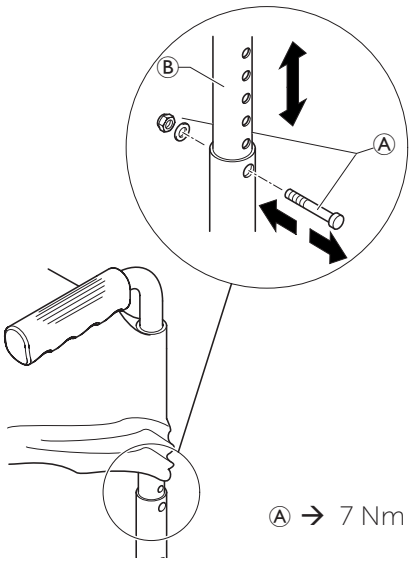
Backrest height (RH)

In order to adjust the backrest height (RH), the backrest tubes have to be fixed in a different position or they have to be exchanged.



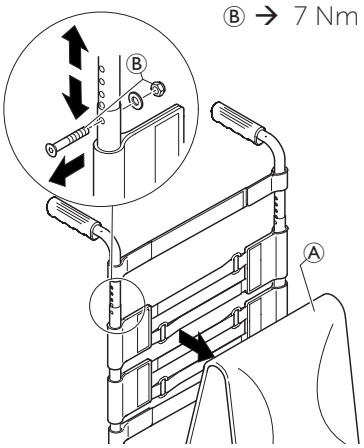
Standard backrest cover, height adjustment

Difficulty: ●○○ *Tools:* ⬢*3* ⬡*8*

- Push the backrest cover so that bolt and nut on the backrest tube are revealed.
- Remove bolt and nut Ⓐ.
- Adjust the backrest tube Ⓑ to the required height then insert the screw Ⓐ into the closest hole and tighten it again.
- Carry out the same setting on both sides.
- Reposition the backrest cover correctly.

Tension adjustable back, height adjustment

Difficulty: ●○○ *Tools:* ⬢*3* ⬡*8*



- Remove the backrest cover Ⓐ.
- Slide the backrest straps either up or down to locate the fixing bolt Ⓑ.
- Remove bolt and nut Ⓑ.
- Adjust the backrest tube to the required height then insert the screw Ⓑ into the closest hole and tighten it again.
- Carry out the same setting on both sides.
- Reposition the backrest cover.

ⓘ In the case of major changes of the backrest height (RH), bands may have to be inserted or removed and a larger/smaller backrest cover may be necessary.

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Backrest angle (RW)

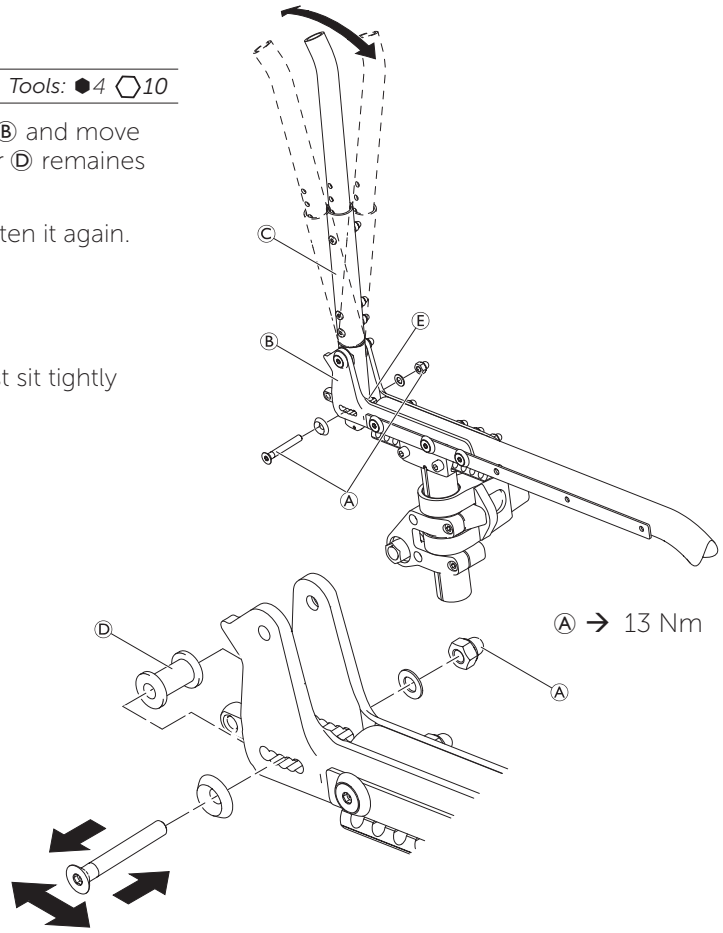
Backrest, angle adjustment

Difficulty: ●●○ *Tools:* ⬢4 ⬡10

- Remove the lower bolt Ⓐ from the side supporter Ⓑ and move the backrest Ⓒ to the required position. The spacer Ⓓ remaines fixed in the latch bolt Ⓔ.
- Insert bolt and nut Ⓐ into the closest hole and tighten it again.
- Carry out the same setting on both sides.

Function control:

The backrest must fold easily and the ratchet bolt must sit tightly against the side supporter.

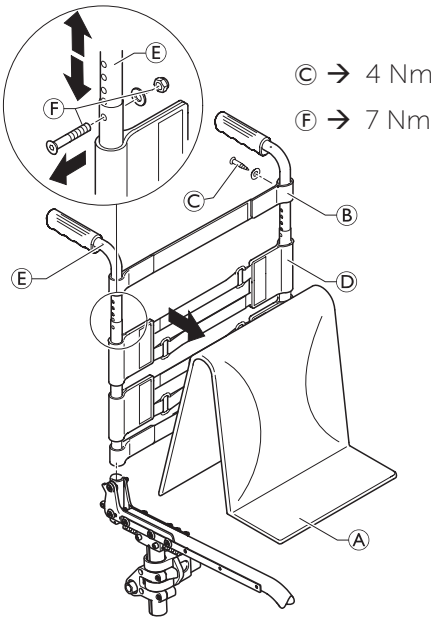


Push handles / backrest telescopes

Push handle / telescopic tube replacement

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Remove the backrest cover Ⓐ.
- Remove the screws Ⓒ holding the uppermost backrest band Ⓑ (or standard backrest cover) to the push handles Ⓔ (or telescopic tubes).
- Slide the backrest straps Ⓓ (or standard backrest cover) either up or down to locate the fixing bolt Ⓕ.
- Remove bolts and nuts on both sides Ⓕ.
- Remove push handles Ⓔ (or telescopic tubes).
- Slide new push handle through backrest band Ⓑ and fix it on the backrest with bolt Ⓕ.
- Fix the upmost backrest band Ⓑ (or standard backrest cover) with screws Ⓒ.
- Carry out the same setting on both sides.
- Reposition the backrest cover correctly.



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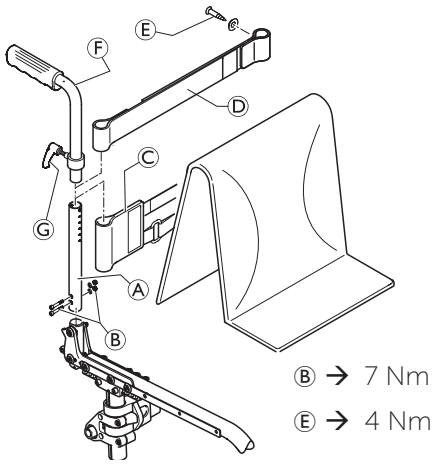
Height adjustable integrated push handles

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Fit the backrest tube Ⓐ corresponding to the desired backrest height (RH) on both sides using the bolts Ⓑ.
- Slide the backrest bands Ⓒ corresponding to the desired backrest height (RH) and, if required, the end band Ⓓ (or the standard backrest cover) over the backrest tube Ⓐ.
- Slide the push handle Ⓕ into the backrest tube Ⓐ on both sides and secure it at the desired height using the clamp bolt Ⓖ.
- Secure the end band Ⓓ (or the standard backrest cover) to the backrest tube Ⓐ on both sides using the screws Ⓔ.



Height adjustable rear set push handles

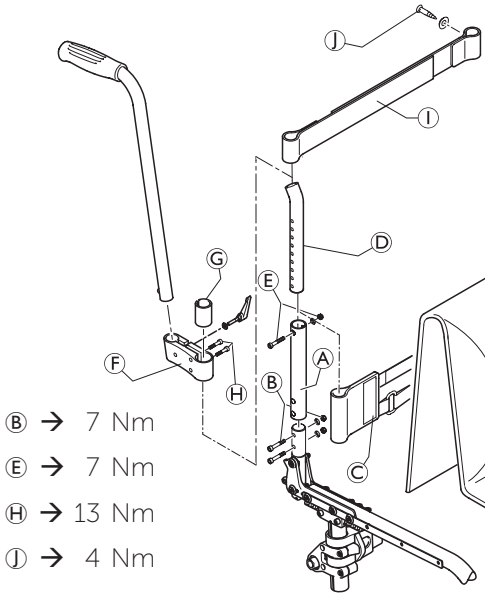
These push handles can only be used in combination with adjustable backrests, not with standard backrests.

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

- Fit the intermediate tube Ⓐ on both sides using the bolts Ⓑ.
- Slide the backrest bands Ⓒ corresponding to the desired backrest height (RH) onto the intermediate tube Ⓐ.
- Fit the telescopic tube Ⓓ corresponding to the desired backrest height (RH) on both sides using the bolt Ⓔ.
- Slide the holder Ⓕ and the sleeve Ⓖ onto the telescopic tube Ⓓ and secure it using the screws Ⓗ.

For the minimum backrest height, the holder of the rear set push handle must be fitted to the intermediate tube Ⓐ. In this case, the sleeve Ⓖ is not required.

- Slide the end band Ⓘ onto the telescopic tube Ⓓ and secure it on both sides using the screws Ⓙ.



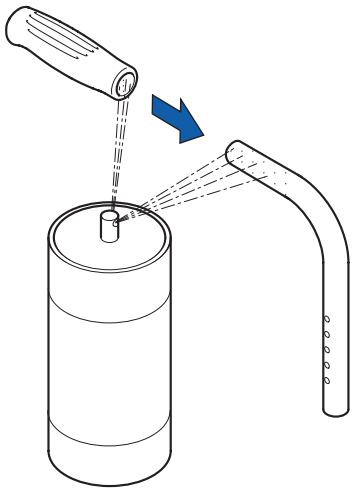
Replacing the handle

An adhesive (e.g. hair spray) is used in these instructions. When applied to the handle, this substance works as a lubricant and as an adhesive once dry.

⚠ After drying, the adhesive used must be able to resist a pull-off force of 750 N. If in doubt, contact Küschall® AG.

Difficulty: ●●○

- Remove the old handle.
- Remove any residue (residual adhesive, grease, dust) from the push handle tube.
- Apply a thin layer of hair spray all over the surface of the push handle tube onto which the handle is to be slid.
- Apply a thin layer of hair spray to the inside of the handle.
- Slide the new handle onto the push handle tube.
- Move the handle into the correct position (grooves facing upwards).



ⓘ If a long handle has been fitted and this is to be replaced with a short one, the push handle tube must be shortened by 35 mm. The push handle tube must be replaced when switching from a short to a long handle.

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Replacing foldable push handles

Difficulty: ●○○ *Tools:* *Hole punch pliers 6 mm, ⬢ 3, 4*

- Remove the old foldable push handle.
- Pull down the backrest cover Ⓕ on the telescopic tube, until its hole Ⓑ is uncovered.

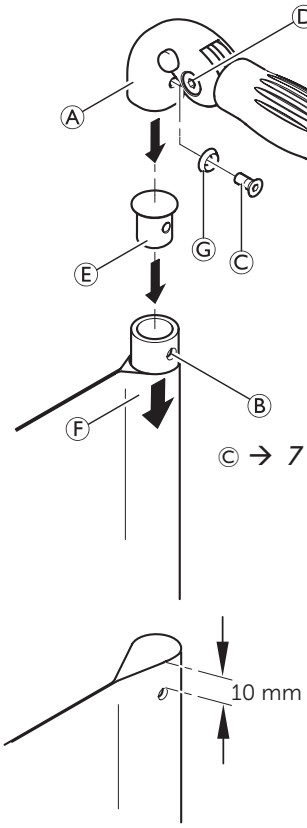
IMPORTANT!
Make sure that the threaded insert Ⓔ (part no. 1580450) supplied with the new push handle is used for assembly.

- Place the threaded insert Ⓔ in the telescopic tube.
- Punch a hole through the backrest cover with a distance of 10 mm from the upper egde, using hole punch pliers (see graphic below).
- Slide the new foldable push handle Ⓐ onto the telescopic tube.
- Pull up the backrest cover, until it covers completely the rear hole in the pushhandle.
- Fix the foldable push handle with screw Ⓒ and washer Ⓖ.
- Check screws Ⓓ on both sides of the push handle and re-tighten if necessary.
- Carry out the same steps for the other push handle.

IMPORTANT!
Make sure that the folding force is approximately 5 N (0.5 kg).

IMPORTANT!
Fixing screw Ⓒ may only be used once. Alternatively the screw can be cleaned (remove old thread locking adhesive) and reinstalled with new low-strength thread locking adhesive.

The retrofit of foldable push handles requires new tubing.



Ⓒ → *7 Nm* (low-strength)

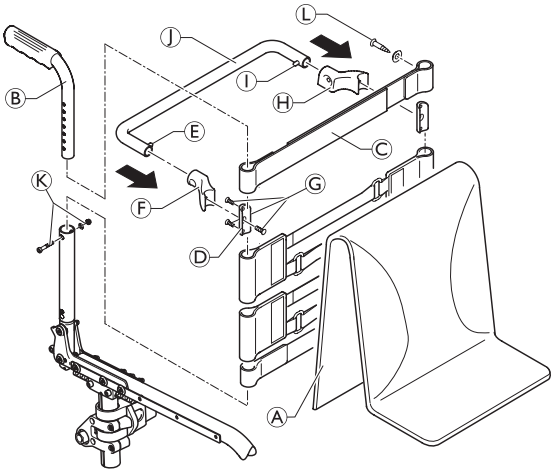
Stabilisation bar

Stabilisation bar assembly

Difficulty: ●●○ *Tools:* ⬢3 ⬡8 ✖2

With a back height RH405 or larger it is possible to assemble a stabilisation bar to increase the rigidity of the backrest handles.

- Remove backrest cover Ⓐ, push handles Ⓑ and 10 cm backrest band (or end band, if no push handles are assembled).
- Assemble a 5 cm backrest band Ⓒ or end band with the screws Ⓛ to the push handles Ⓑ.
- Assemble the push handles Ⓑ with bolts and nuts Ⓚ.
- Attach the clamps Ⓓ together with the RH socket Ⓕ and the LH socket Ⓗ with the screws Ⓖ below the backrest band Ⓒ to the push handles Ⓑ.
- Replace the push handle/backrest band/socket assembly.
- Press pin Ⓔ and slide the stabilisation bar Ⓙ into the RH socket Ⓕ then swing the stabilisation bar upwards, press pin Ⓘ and click the stabilisation bar into the LH socket Ⓗ.



Ⓖ → 4 Nm
Ⓚ → 7 Nm
Ⓛ → 4 Nm

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FOOTRESTS

Lower leg length (UL)

To change the lower leg length, the footrest can be fixed at a higher or lower position, → Chap. Footrests, Footrest, height adjustment.

Short lower leg lengths (UL) can be set using a high-mounted footrest, → Chap. Footrests, Footrest mounted in high position.

Aluminium frame:	UL220 – UL310 high mounted footrest UL320 – UL390 standard footrest, short frame UL400 – UL500 standard footrest, long frame
Titan frame:	UL220 – UL340 high mounted footrest UL360 – UL390 standard footrest, short frame UL400 – UL500 standard footrest, long frame
Carbon frame:	UL300 – UL340 high mounted footrest UL400 – UL500 standard footrest

Possible footplate situations in relationship to seat angle and front wheel size

		Set to front						*Set to rear*					
		ST340 - ST380			*ST400 - ST480*			*ST340 - ST380*			*ST400 - ST480*		
	Seat angle	*3"*	*4"*	*5"*	*3"*	*4"*	*5"*	*3"*	*4"*	*5"*	*3"*	*4"*	*5"*
Frame 75°	*0 mm*	✓	✓	✓	✓	✓	✓	✓	×	×	✓	×	×
	10 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
	20 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
	30 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
	40 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×
	50 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	60 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	70 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Frame 85°	*30 mm*	✓	✓	×	✓	✓	×	×	×	×	×	×	×
	40 mm	✓	✓	×	✓	✓	×	✓	×	×	×	×	×
	50 mm	✓	✓	✓	✓	✓	×	✓	×	×	✓	×	×
	60 mm	✓	✓	✓	✓	✓	✓	✓	×	×	✓	×	×
	70 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	×	×
	80 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	×	×
	90 mm	✓	✓	✓	✓	✓	✓	✓	✓	×	✓	✓	×
	100 mm	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	×

If the knee-to-heel length is smaller than seat height front (SHv) minus 100 mm, there are no conflicts possible between footplate and castors.

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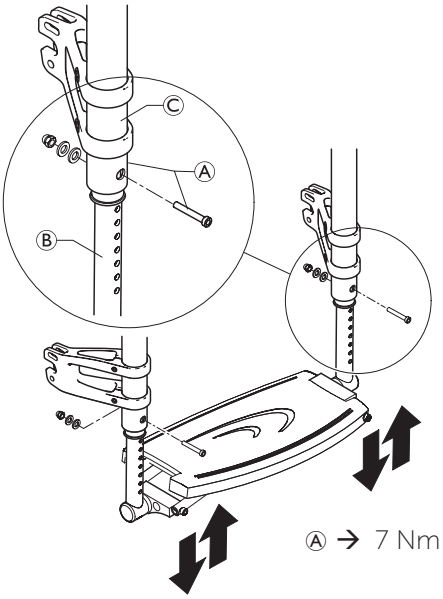
Footrest, height adjustment

Difficulty: ●○○ *Tools:* ⬢*4* ⬡*8*

- Remove on both sides bolt and nut Ⓐ, which fix the telescopic tube Ⓑ to the frame Ⓒ.
- Extend the footrest telescope Ⓑ to the required length, then insert the bolts Ⓐ into the closest holes.
- Carry out the same setting on both sides.
- Tighten the locking bolts Ⓐ on both sides.

Function control

Check that the footrest is firmly attached but that it can fold easily.



Footplate

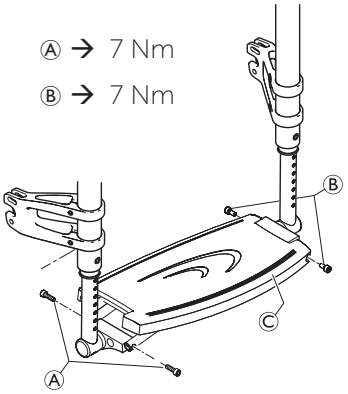
Footplate replacement

Difficulty: ●○○ *Tools:* ⬢*4* ⬡*8*

- Remove the screws Ⓐ and the screws Ⓑ.
- Remove the footplate Ⓒ and replace it by the new one.
- Attach the footplate Ⓒ with the screws Ⓐ and the screws Ⓑ.

Function control

Check that the footrest is firmly attached but that it can fold easily.



Fitting the footplate set to the front

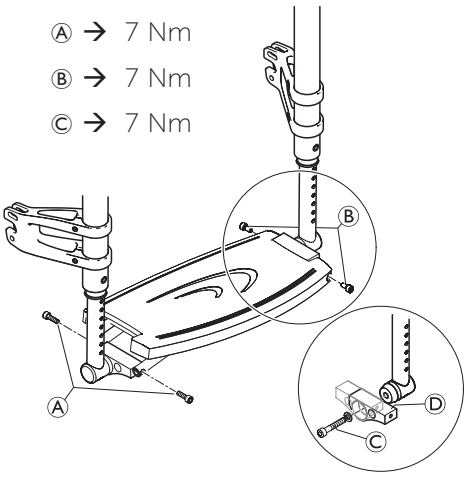
The footplate is fitted set back as standard.

Difficulty: ●●○ *Tools:* ⬢*4, 5*

- Remove the screws Ⓐ and the screws Ⓑ.
- Remove the screws and washers Ⓒ on both sides.
- Rotate the footplate mounting Ⓓ by 180°. The elongated side of the footplate mounting Ⓓ is now pointing forwards.
- Fit the footplate mounting Ⓓ again using the screws and washers Ⓒ.
- Secure the footplate using the screws Ⓐ and the screws Ⓑ.
- Set the desired footplate angle and tighten the screws Ⓒ, → Chap. Footrests, Angle adjustment of the footplate.

Function control

Check that the footrest is firmly attached but that it can fold easily.



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Angle adjustment of the footplate

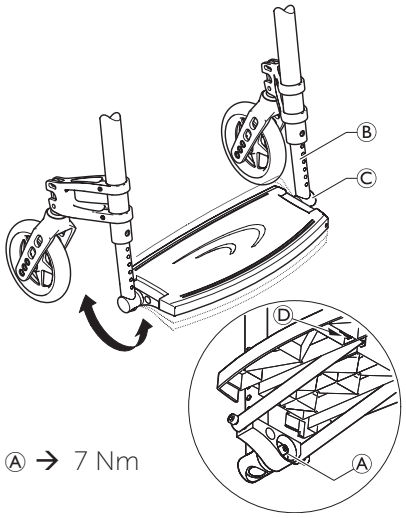
Difficulty: ●○○ *Tools:* ⬢ *4, 5* ⬡ *8*

- Slightly loosen the bolts Ⓐ under the footplate which secure the telescopic tube Ⓑ to the footplate mounting Ⓒ.
- Set the footplate to the desired angle.
- Tighten the bolt Ⓐ on both sides.

Function control

Check that the footplate can fold easily.

- To adjust the folding ability of the footplate, tighten resp. loosen nut Ⓓ on the underside of the footplate.



Ⓐ → 7 Nm

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SIDE PARTS

Clothes-guard assembly

Difficulty: ●●○ *Tools:* ⬢*4* ⬡*10*

1 Attach the fixation piece Ⓐ with bolt and nut Ⓑ and screw Ⓒ to the frame.

■ Align the clothes guard Ⓓ to the rear wheel and note the best hole on the clothes guard to fix it to the backrest hinge.

2 Remove the bolt Ⓔ from the backrest joint.

IMPORTANT!
If a pelvic belt is fitted, add the washer Ⓕ.

■ Fit the clothes-guard Ⓓ using the bolt present (and any additional washer) to the backrest joint.

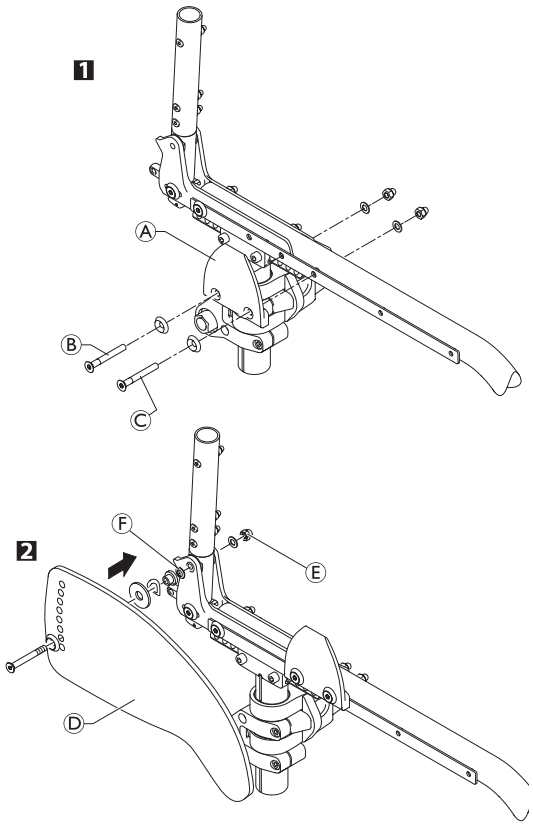
Ⓑ → 13 Nm / 10 Nm with carbon frame

Ⓒ → 7 Nm

Ⓔ → 13 Nm

Function control:

Fold and unfold the backrest (this must be done easily). Make sure the clothes-guards are positioned slightly higher than the rear wheels. Check that the clothes-guards flip up easily.



Clothguard sizes in relationship to rear seat heightm, rear-wheel size and mounting position of the vertical brace

Rear wheel 22"									
SHh	*Pos 1*	*Pos 2*	*Pos 3*	*Pos 4*	*Pos 5*	*Pos 6*	*Pos 7*	*Pos 8*	*Pos 9*
390	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
400	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
410	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
420	*M*	*M*	*M*	*S*	*S*	*S*	*S*	*S*	*S*
430	*M*	*S*	*S*	*S*	*S*	*S*	*S*	*S*	*S*
440	*S*	*S*	*S*	*S*	*S*	*S*	*S*	*S*	*S*
450	×	×	×	*S*	*S*	*S*	*S*	*S*	*S*
460	×	×	×	×	×	×	×	×	×
470	×	×	×	×	×	×	×	×	×
480	×	×	×	×	×	×	×	×	×
490	×	×	×	×	×	×	×	×	×

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Rear wheel 24"									
SHh	*Pos 1*	*Pos 2*	*Pos 3*	*Pos 4*	*Pos 5*	*Pos 6*	*Pos 7*	*Pos 8*	*Pos 9*
390	*XL*	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*
400	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*	*L*
410	*XL*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*L*
420	*L*	*L*	*L*	*L*	*L*	*M*	*M*	*M*	*M*
430	*L*	*L*	*L*	*M*	*M*	*M*	*M*	*M*	*M*
440	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
450	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
460	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
470	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
480	×	×	×	×	×	×	*S*	*S*	*S*
490	×	×	×	×	×	×	×	×	×

Rear wheel 25"									
SHh	*Pos 1*	*Pos 2*	*Pos 3*	*Pos 4*	*Pos 5*	*Pos 6*	*Pos 7*	*Pos 8*	*Pos 9*
390	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
400	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
410	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
420	*XL*	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*
430	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*	*L*
440	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*L*	*L*
450	*L*	*L*	*L*	*L*	*L*	*M*	*M*	*M*	*M*
460	*L*	*L*	*L*	*L*	*M*	*M*	*M*	*M*	*M*
470	*L*	*L*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
480	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*	*M*
490	×	×	*M*	*M*	*M*	*M*	*M*	*M*	*M*

Rear wheel 26"									
SHh	*Pos 1*	*Pos 2*	*Pos 3*	*Pos 4*	*Pos 5*	*Pos 6*	*Pos 7*	*Pos 8*	*Pos 9*
390	-	-	-	-	-	-	*XL*	*XL*	*XL*
400	-	-	-	-	*XL*	*XL*	*XL*	*XL*	*XL*
410	-	-	-	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
420	-	-	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
430	-	-	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*	*XL*
440	-	*XL*	*XL*	*XL*	*XL*	*L*	*L*	*L*	*L*
450	*XL*	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*
460	*XL*	*XL*	*L*	*L*	*L*	*L*	*L*	*L*	*L*
470	*XL*	*L*	*L*	*L*	*L*	*L*	*M*	*M*	*M*
480	*L*	*L*	*L*	*L*	*M*	*M*	*M*	*M*	*M*
490	*L*	*L*	*L*	*M*	*M*	*M*	*M*	*M*	*M*

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Mud guard assembly

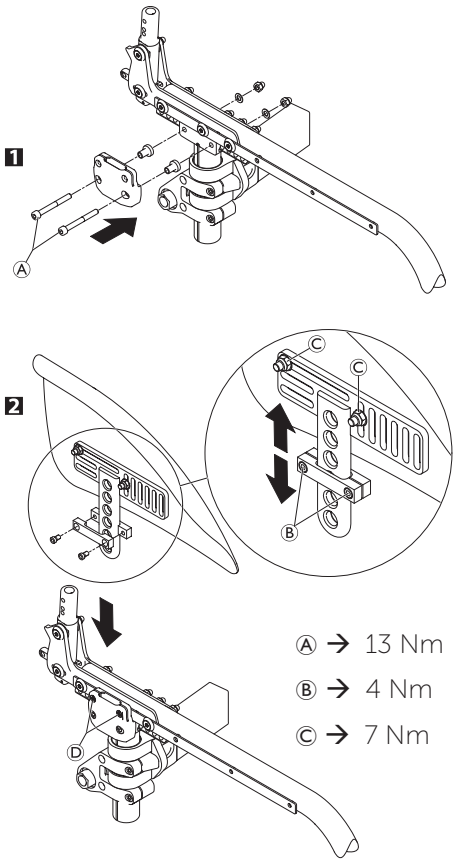
Difficulty: ●●○ *Tools:* ⬢*3, 5, 4* ⬡*10* ✖*2*

If replacing a clothes guard with a mudguard, first remove the clothes guard and the bracket attached to the vertical brace.

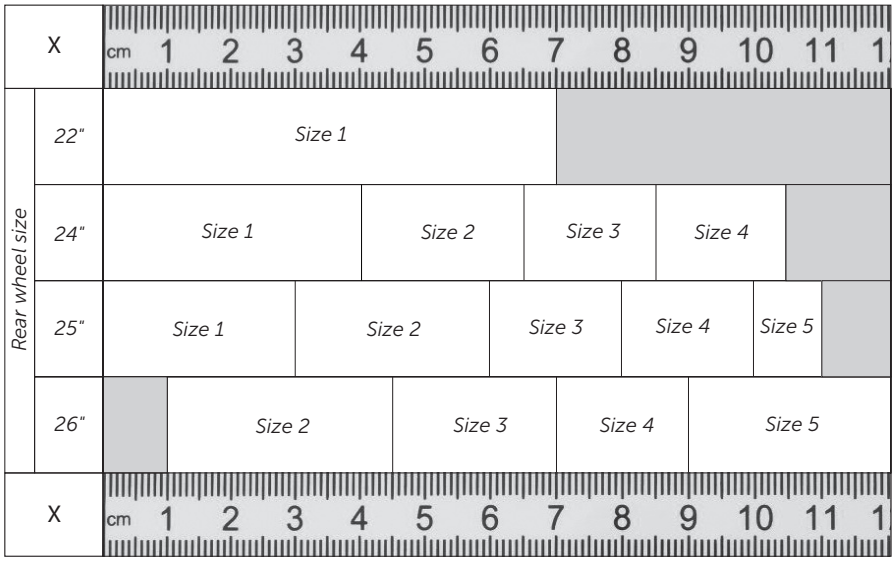
1. Attach the bracket to the vertical brace with the screws Ⓐ and remount the rear wheels.
2. Slightly loosen the two screws Ⓑ on the adjustment plate and move it along the mounting bracket until the mudguard is in position.

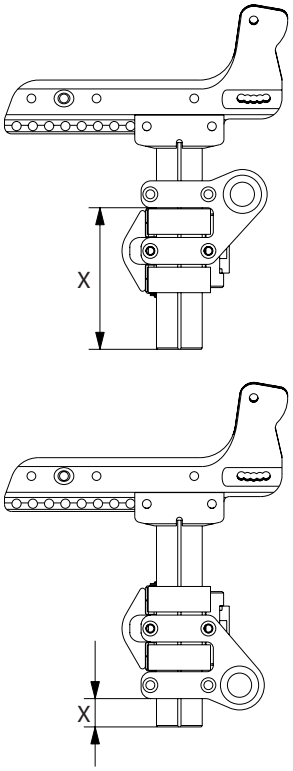
- The position of the mudguard can also be adjusted: To do this, loosen the bolts Ⓒ, adjust the mudguard position as required and retighten the bolts Ⓒ.
- Tighten the screws Ⓑ.
- Carry out the setting on both sides.
- By tightening or loosening the screws Ⓓ you can adjust how easily the armrest can be pulled out or pushed in.

⚠ The distance between the mudguard and the wheel must be either < 8 mm or > 25 mm to prevent fingers from becoming caught between the wheel and the mudguard.



Mudguard size in relationship to rear seat height and rear wheel size


X
cm 1 2 3 4 5 6 7 8 9 10 11 1
Rear wheel size
22" Size 1
24" Size 1 Size 2 Size 3 Size 4
25" Size 1 Size 2 Size 3 Size 4 Size 5
26" Size 2 Size 3 Size 4 Size 5
X
cm 1 2 3 4 5 6 7 8 9 10 11 1



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Assembling and adjusting the siderest

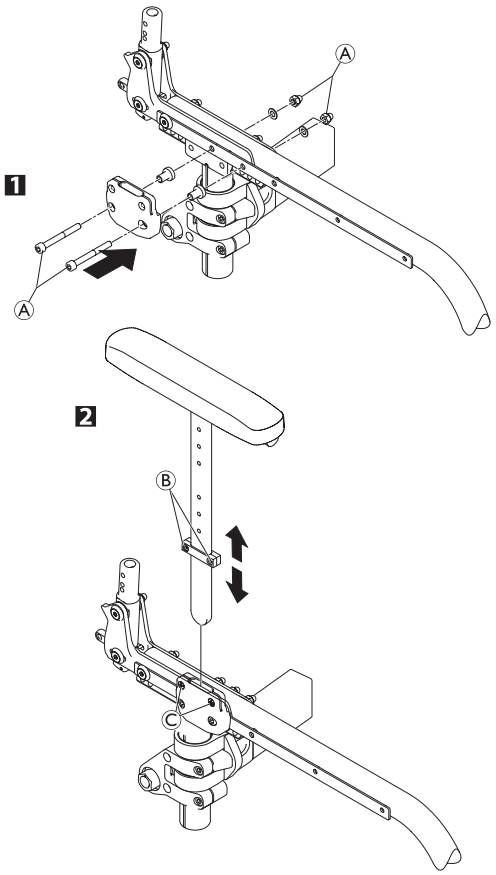
Difficulty: ●●○ *Tools:* ⬢*3, 4* ⬡*10* ✖*2*

1. Attach the bracket to the seat module with the bolts and nuts Ⓐ.
2. Slightly loosen the two screws Ⓑ on the height adjustment bracket then move the siderest to the desired height.
- Tighten the screws Ⓑ.
- By tightening or loosening the screws Ⓒ, you can adjust how easily the armrest can be pulled out or pushed in.

A 3° wheel camber requires that an additional set of distance plates be fitted between the adapter plate and the side profile, → Chap. Rear wheels, Adapterplate spacer assembly.

Ⓐ → 13 Nm / 10 Nm with carbon frame

Ⓑ → 4 Nm



Assembling the tubular armrest

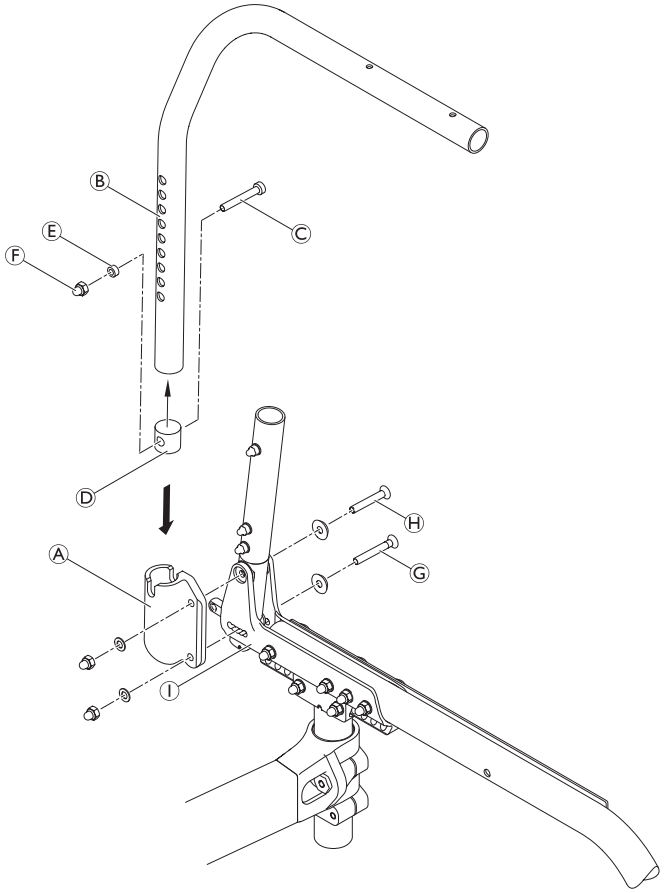
- Mount the armrest holder Ⓐ with countersunk screws Ⓖ and Ⓗ, washers and cap nuts on the side supporter Ⓘ.
- Place the armrest clamp part sleeve Ⓓ to the 3rd hole from above inside the armrest tube Ⓑ.
- Turn the cylinder head bolt Ⓒ through the smaller hole of the armrest tube completely into the armrest clamp part a sleeve.
- Secure the cylinder head bolt with sleeve Ⓔ and securing cap nut Ⓕ from the other side.

If the folding mechanism affects the armrest tube when folding the wheelchair, sleeve Ⓓ must be displaced downwards.

- Mount the tube plugs and the armrest pad.
- Place the armrest in the holder.

Ⓒ → 7 Nm

Ⓕ → 7 Nm (high strength)



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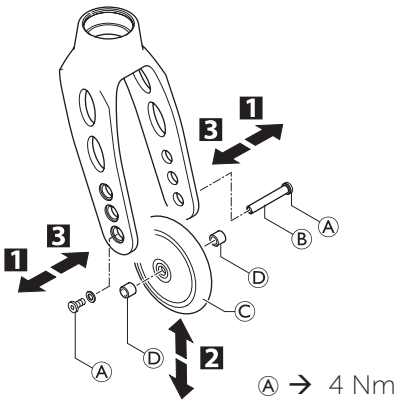
FRONT WHEELS

Replacing a front wheel

Difficulty: ●○○ *Tools:* ⬢ *2x3*

1. Remove the screw Ⓐ with disk on one side. Remove the wheel axle Ⓑ.
2. Remove the front wheel Ⓒ.
- Place the sleeves Ⓓ between the new front wheel and the fork.
3. Slide the axle Ⓑ through the fork, sleeves Ⓓ and the front wheel Ⓒ and fix the axle using the screw Ⓐ. Here, use the new screw supplied with the wheel as this screw comes with a thread-locking device.



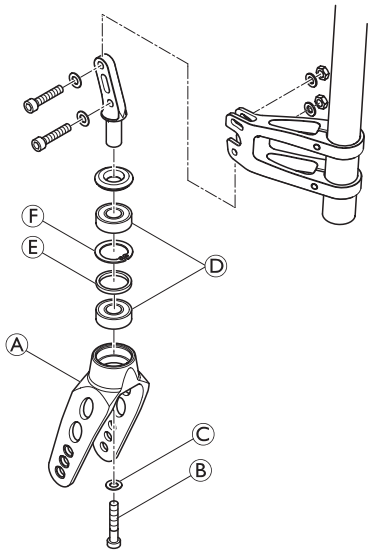
Function check:

The wheel may not wobble, but must rotate easily.

Replacing a front wheel fork

Difficulty: ●●○ *Tools:* *10*

- Remove the bolt Ⓑ with the washer Ⓒ.
- Remove the front wheel fork Ⓐ.
- Check the bearing Ⓓ , distance ring Ⓔ and circlip Ⓕ and replace if required.
- Insert the new front wheel fork with the washer and the bolt and tighten the bolt.
- Assemble the front wheel, → Chap. Front wheels; Replacing a front wheel.
- Carry out the function check (see below).

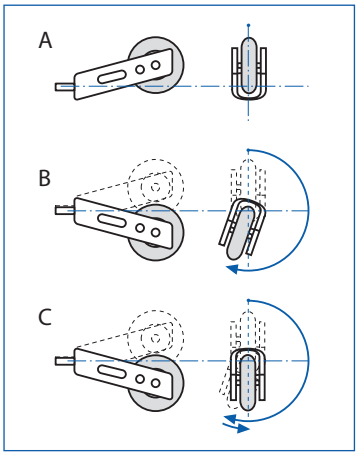


Function check:

Tip the wheelchair backwards by 90° so that it is lying on the backrest and the rear wheels. Turn the fork upwards (position A) and let it tip downwards.

The fork has been correctly adjusted if it easily turns to beyond the bottommost point and remains there (position B).

If the fork turns back to the lower position (position C), it has not been sufficiently tightened. There is a risk that the front wheels will start to wobble at high speeds.



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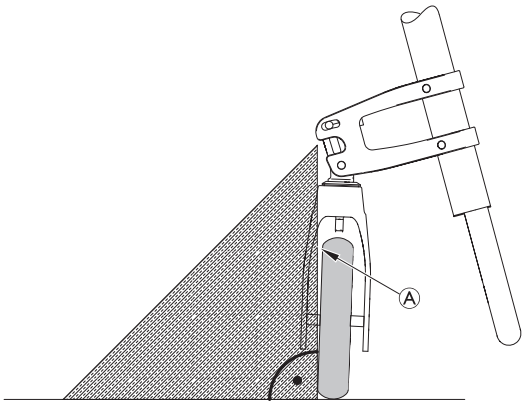
Checking and adjusting the castor angle

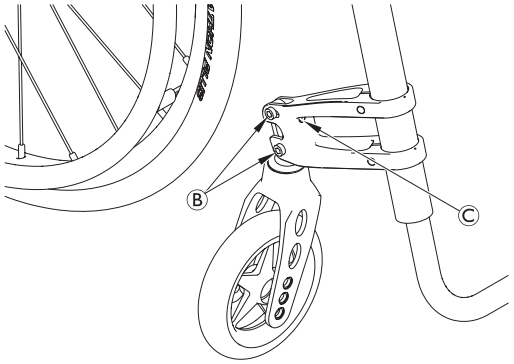
Difficulty: ●○○ *Tools: 90° angle (Triangle ruler or similar),* 10, ⬢ 5

- Place the wheelchair on a plane surface.
- Turn the castor wheel transversely to the rear wheels.
- Apply a 90° ruler on the castor wheel and check if it is in a 100% vertical position to the floor.

It shows immediately whether the castor is in 90° to the floor or not. If there is a gap Ⓐ between the ruler and the castor on the upper or lower rim of the wheel, it clearly indicates that the castor angle is not 90°. In the graphic to the right, the gap Ⓐ on the upper part of the castor wheel shows that the fork is set too much to the rear (If the gap would be on the lower part, the fork would be set too much to the front).

- If the castor wheel is not vertical, loosen bolts Ⓑ.
- Adjust the castor angle with screw Ⓒ until the wheel is 100% parallel to the vertical side of the ruler.
- Re-tighten bolts Ⓑ.
- Perform the same adjustment on both sides.





Ⓑ → 13 Nm

Checking and adjusting the drift angle

Difficulty: ●○○ *Tools: 90° angle (Triangle ruler or similar),* ⬢ 5

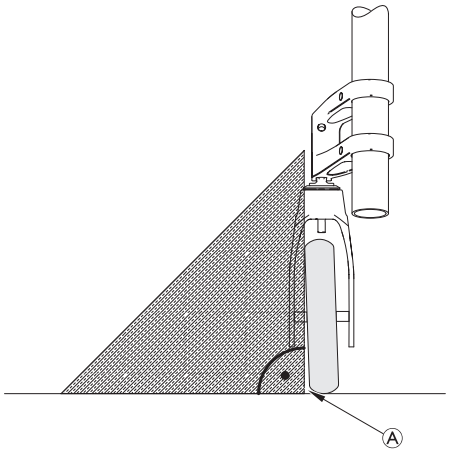
- Place the wheelchair on a plane surface.

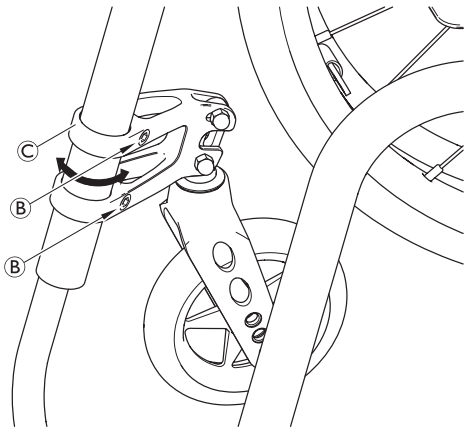
The drift angle is measured the same way as the castor angle: For this adjustment the castor wheel has to be turned in driving direction (parallel to the rear wheels).

- Turn the castor wheel in driving direction, parallel to the rear wheels.
- Apply a 90° ruler on the castor wheel and check if it is in a 100% vertical position to the floor.
- If the castor wheel is not vertical, unscrew the bolts Ⓑ with washers on the supporter.

IMPORTANT!
Possible damage to the paint on the frame tube.
Be very careful when turning the supporter around the frame tube.

- Turn the supporter Ⓒ in- or outside until the castor wheel is parallel to the vertical side of the ruler.
- Retighten bolts with new adhesive and washers.
- Perform the same adjustment on both sides.





Ⓑ → 10 Nm (high-strength)

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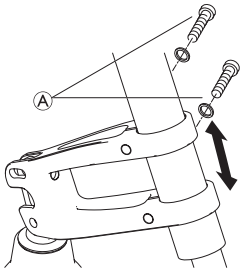
Shift supporter on the frame

Difficulty: ●○○ *Tools:* ⬢ *5*

The supporter on the frame may be infinitely adjusted.

IMPORTANT!
Possible damage to the paint on the frame tube.
Be very careful when inserting the supporter in frame tube.

- Loosen the bolts Ⓐ with the washers on the supporter.
- Push the supporter into the required position.
- Retighten screws with new adhesive and washers.
- Tighten the bolts Ⓐ with new adhesive and washers on the supporter.
- Perform the same setting on both sides.



Ⓐ → 10 Nm (high-strength)

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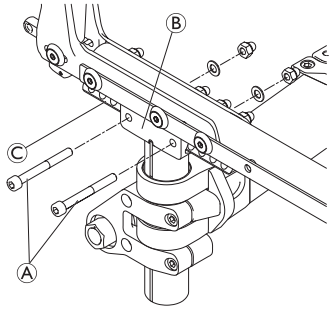
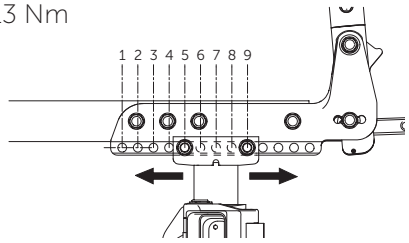
REAR WHEELS

Rear wheels, repositioning



Ⓐ → 13 Nm



The chair will be more stable, the further rearwards that the rear wheels are fitted.

There are 9 possible rear wheel positions, adjustable via the mounting position of the vertical brace.

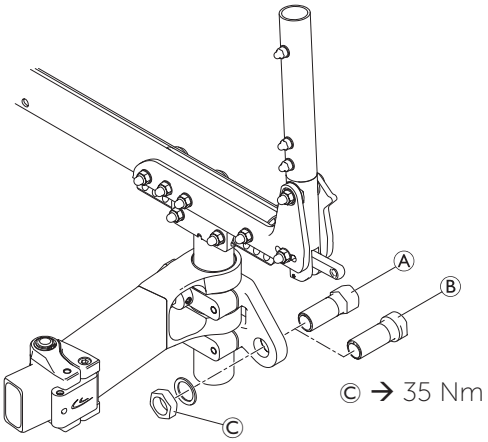
Difficulty: ●○○ *Tools:* ⬢ *4,* ⬡ *10*

- Remove the bolts Ⓐ from slide Ⓑ of the vertical brace.
- Slide the vertical brace on the side support Ⓒ to the desired position.
- Insert bolts Ⓐ in new position and tighten the nuts.
- Carry out the same setting on both sides.

Wheel camber, adapter sleeves

1° adapter sleeves Ⓐ or 3° adapter sleeves Ⓑ can be used. The wheel camber changes accordingly.

The rear wheels must subsequently be adjusted until parallel.



Ⓒ → 35 Nm

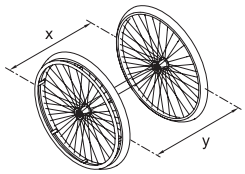
Adjustment of rear wheel parallelism

Difficulty: ●●● *Tools:* ⬡ *22* ▬C *19*

- Measure the distance between the front and rear wheels at axle level.

If this distance is not the same (x ≠ y):

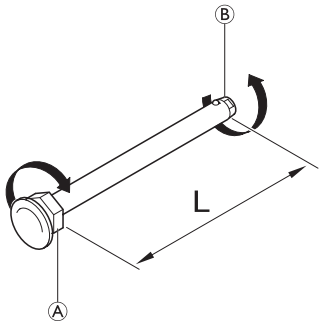
- Loosen the adapter sleeve nut Ⓒ.
- Use the open-end spanner to rotate and adjust the adapter sleeves on both sides so that the distance between the front and rear wheels at axle level is identical (x = y).
- Re-tighten the adapter sleeve nut Ⓒ.



Adjusting the removable axle

Difficulty: ●●○ *Tools:* ▬C *11, 19*

- Remove the rear wheel.
- Hold the end of the removable axle Ⓑ using the straddle spanner.
- Adjust the length L of the removable axle by turning the nut Ⓐ. The length is correctly adjusted if the removable axle engages correctly when fixing the wheel and wheel has just minimal clearance.



The wheels must be exchanged (left to right side and vice versa) after adjusting both removable axles. The adjustment must now be checked or carried out again to ensure the wheels can be switched.

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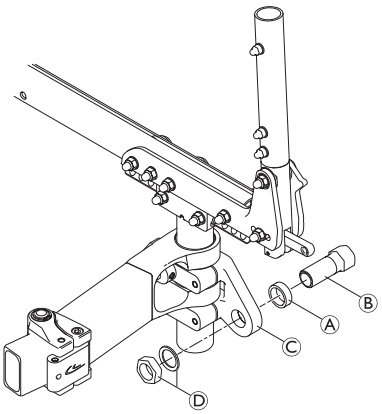
Distance sleeves

If additional side parts or another type of rear wheel is fitted or if the rear seat height is adjusted, the distance between the rear wheels may have to be increased by fitting additional distance sleeves.

Distance sleeve assembly

Difficulty: ●○○ *Tools:* ⬡ *22* ⊂ *19*

- Remove rear wheel.
- Loosen and remove adapter sleeve Ⓑ, nut and washer Ⓓ.
- Slide the distance sleeve Ⓐ onto the thread of the adapter sleeve Ⓑ.
- Secure the adapter sleeve to the adapter plate Ⓒ again using the nut and washer Ⓓ.
- The rear wheels must be subsequently adjusted until parallel, → Chap. Rear wheels, Adjustment of rear wheel parallelism.

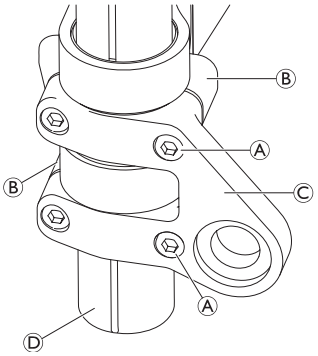


Ⓓ → 35 Nm

Adapterplate, adjustment to folding unit or assembly of new adapter plate

Difficulty: ●○○ *Tools:* ⬢ *5*

- Slightly loosen the two bolts Ⓐ.
- If an option is mounted loosen nuts of the adaption holder, → Chap. Antitipper / Transit wheels Antitipper assembly.
- Move the adapter plate Ⓒ with both brackets Ⓑ on the vertical tube Ⓓ into the desired position.
- Fix the adapter plate with the two bolts Ⓐ.



Ⓐ → 13 Nm

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BRAKES

Fitting / adjusting the parking brake

Difficulty: ●●○ *Tools:* ⬢5

⚠ Following each positioning, the rear wheel parking brakes (e.g. when changing the wheel chamber) must be readjusted.

⚠ The parking brake function is only guaranteed if the tire has the corresponding air pressure.

- Check that the rear wheels have sufficient air.

1. Loosely fix the clamping piece Ⓑ to the frame with the screw Ⓐ.
2. Slide the brake Ⓒ into the correct position and tighten the screw Ⓐ.

ℹ When the brake is on, the brake shoe Ⓓ must press approx. 4 mm into the tire.

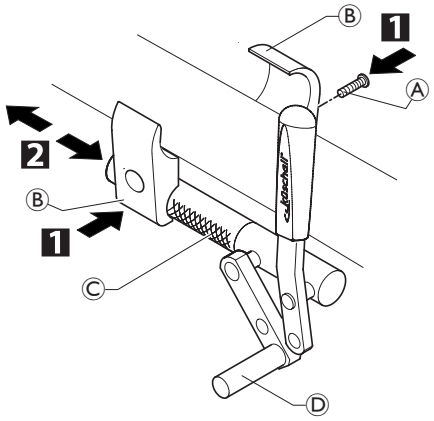
ℹ Furthermore, please note that very little force is required for activating and deactivating the brake. If necessary, a brake lever extension can be fitted.

Visual control

Check that the parking brake is correctly positioned. The brake is correctly adjusted if the brake shoe does not press more than 4 mm into the tire when the brake is on.

Function control

Place the loaded wheelchair on a ramp with a 7° slope with the parking brake on. The wheelchair must not move. Carry out this check with the wheelchair both facing down the ramp and facing up the ramp.



Ⓐ → 13 Nm / 10 Nm with carbon frame

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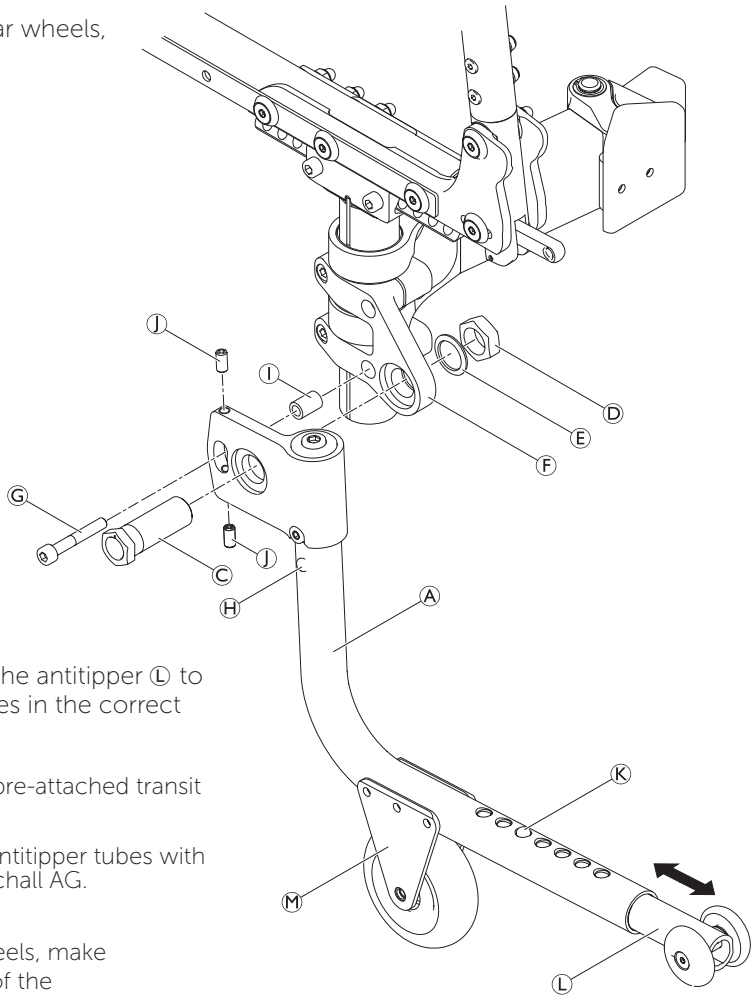
Antitipper / Transit wheels

Antitipper assembly

Difficulty: ●●○ *Tools:* ⬢*3, 5, 6,* ⬡*22,* ▬C *19*

- Remove adapter sleeve Ⓒ, nut Ⓓ and washer Ⓔ.
- Mount the antitipper Ⓐ with the adapter sleeve Ⓒ, nut Ⓓ and washer Ⓔ, sleeve Ⓘ, and the screw Ⓖ to the clamping part Ⓕ.
- Adjust the angle of the antitipper and tighten in the desired position with adjusting screws Ⓙ.
- Adjust the rear wheel parallelism, → Chap. Rear wheels, Adjustment of rear wheel parallelism.

Ⓓ → 35 Nm
Ⓖ → 13 Nm
Ⓙ → 4 Nm



Length adjustment

- Press the spring pin Ⓚ. Slide the inner part of the antitipper Ⓛ to the required position until the spring pin locates in the correct hole.

Optionally, antitippers can be mounted with pre-attached transit wheels Ⓜ (shown in graphic).

Transit wheels require a pre-drilled antitipper tube. Antitipper tubes with pre-attached transit wheels can be orderd from küschall AG.

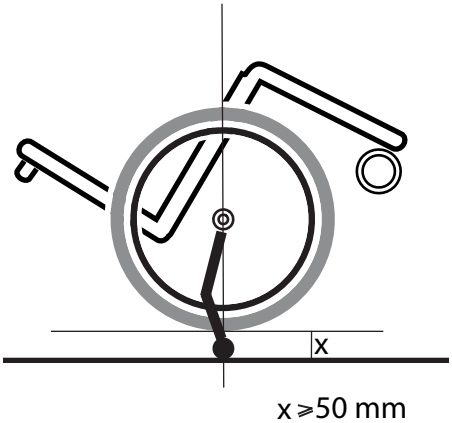
WARNING! Risk of tilting

- When choosing antitippers with transit wheels, make sure to have them installed on both sides of the wheelchair.

To remove the antitipper press button Ⓗ and slide it downwards out of the holder.

Function control:

The distance between the antitipper and the ground must be 40 - 60 mm. It must be easy to fold up the antitipper. Tip the wheelchair backwards using the antitipper until the axle is perpendicular to the antitipper's point of contact with the ground. In this position, the distance between the rear wheel and the ground must be at least 50 mm.



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Tipper aid / Cane holder

Tipper aid and cane holder assembly/adjustment

Difficulty: ●●○ *Tools:* ⬡10

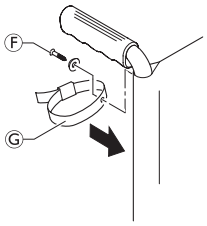
There are 3 options available which are assembled/adjusted equally:

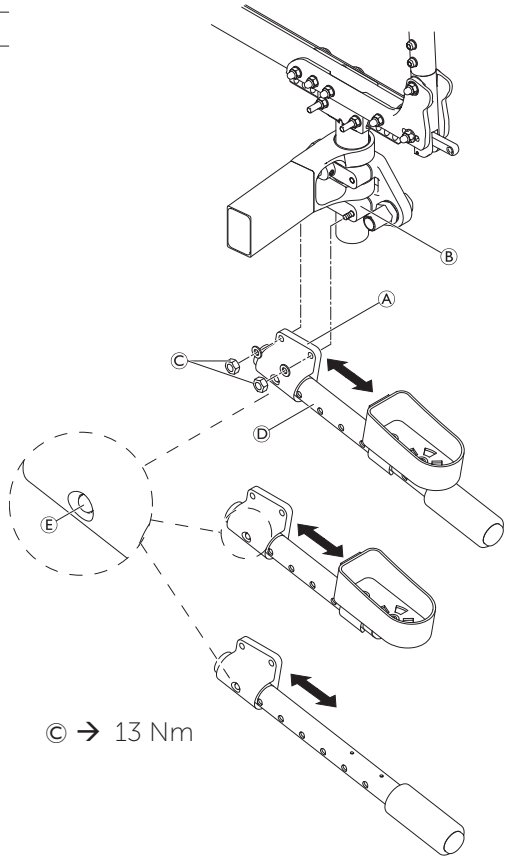
- Tipper aid with cane holder
- Cane holder
- Tipper aid

- Attach the adaption holder Ⓐ onto the bracket Ⓑ using the two nuts and washers Ⓒ.
- Slide the tipper aid tube Ⓓ into the daption holder and fasten it with the spring clip Ⓔ.

For cane holder option:

- Remove the screw Ⓕ from the backrest cover then replace it together with the strap Ⓖ.





Ⓒ → 13 Nm

The cane holder can also be repositioned on the tube.

Function control:

The tipper aid / cane holder may not touch the floor if the wheelchair is tipped backwards.

- If the tipper aid / cane holder touches the floor remove it and change the position of the spring clip Ⓔ. This is done by removing the tube end cap then pushing the spring clip Ⓔ one hole further into the tube using a screwdriver.

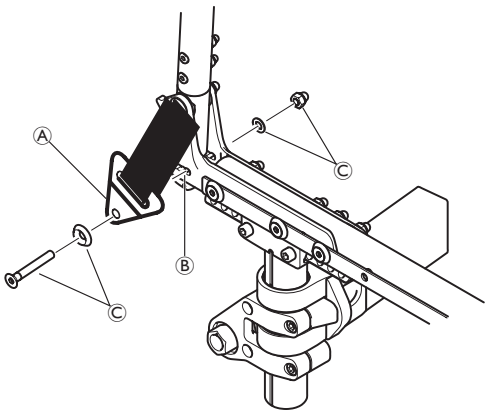
Fitting the pelvic belt

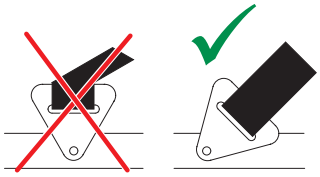
Difficulty: ●○○ *Tools:* *Plastic hammer,* ⬢ *5,* ⬡ *10*

- Fit the steel strap Ⓐ with the bolt Ⓒ on both sides of the side profile Ⓑ, pressing the upper part of the steel strap inwards, e.g. using a plastic hammer.

Ensure that the webbing of the pelvic belt is not twisted during assembly and the locking mechanism shows towards the front.

Ensure that the seat cover does not get caught between the steel strap and the side supporters during assembly.





Ⓒ → 13 Nm

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Service Manual
KÜSCHALL **CHAMPION**
ENGLISH | 2015-09

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